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The North Pickering Project

TRANSPORTATION PLANNING



Ministry of
Housing

Ontario

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consultants limited

**INTERIM
REPORT**

This report was prepared as background material in the planning of the North Pickering Planning Area and does not necessarily constitute a recommendation of the Ministry of Housing nor approval of the Government of Ontario.

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**INTERIM
REPORT
on:
TRANSPORTATION
PLANNING
for:
THE NORTH
PICKERING
PROJECT**

JUNE 1974

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INTRODUCTION 1

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One other important committee is the Railway Relocation Co-ordinating Committee. This is concerned with the removal of the CPR Havelock Subdivision from the proposed Airport. Most of the alternative routes being examined will pass through or close by North Pickering and, to varying degrees, will present opportunities for integrating railway service with industrial development areas. Possibilities for commuter service will also be examined.

While attendance at the meetings of these and other groups has been on an occasional basis, close co-ordination with North Pickering's Transportation Co-ordinator (represented at all committees) has kept Plantown fully informed of all significant transportation plans and projects throughout the entire region. The necessity of developing community plans against the backdrop of North Pickering's regional context has been emphasized time and again by this liaison work. Conversely, the opportunity has been presented to bring to the attention of others the special needs and problems of the community.

1.2 REGIONAL TRANSPORTATION FACILITIES

The map titled Regional Transport Context is presented as background to the discussions contained in this Interim Report. It is emphasized that the potential routes are shown for illustrative purposes only and are not to be taken as a commitment by any of the agencies concerned.

North Pickering Project



HIGHWAYS AND FREEWAYS

- EXISTING MAJOR FACILITIES
- POSSIBLE ALIGNMENT FOR FUTURE FACILITY
- STUDY CORRIDOR FOR FUTURE HWY 407
- STUDY CORRIDORS FOR EAST METRO FREEWAY

RAILWAYS

- EXISTING
- EXISTING TO BE ABANDONED
- STUDY CORRIDOR FOR POSSIBLE RELOCATION OF RAILWAY LINE TO BE ABANDONED

TRANSIT

- EXISTING GO TRANSIT RAIL STATION
- STUDY CORRIDOR FOR NORTH EAST METRO INTERMEDIATE CAPACITY TRANSIT

REGIONAL TRANSPORT CONTEXT



Date Jan. 1975
Scale
Number



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North Pickering Project Team
Ministry of Housing
Province of Ontario

SOME OPTIONS in TRANSPORTATION PLANNING 2

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2. SOME OPTIONS IN TRANSPORTATION PLANNING

2.1 INTRODUCTION

The existing variation in degree of commitment to regional facilities serving North Pickering, the rate at which transportation technology is advancing, the changes in public attitudes regarding transportation modes, the energy crisis and pollution - all imply a substantial range of options in planning the transportation system.

The issues have been presented in Discussion Paper No.1 under Section III Physical Development and in Appendix 'F'. The following is a reproduction of the text contained in the appendix. The focus is on options as seen mainly from the transportation standpoint and the discussion does not here deal with the significant and often complex interrelationships with other aspects of community development. In the extensive work that has gone on since the material was prepared, little has been discovered that would cause any material change in the opinions expressed.

2.2 OPTIONS

Reduction in the need for automobile and transit travel

Much can be achieved by encouraging pedestrian movements and reducing travel distance through concentrating land-use activities and juxtaposing those activities which are particularly strongly interrelated.

Reduction in the role of the automobile and increase in the use of transit

There should be no thought of reducing auto use by attempting to restrict car ownership among the residents. Even if this were politically

acceptable it would not take into account the large number of residents who have to travel throughout the day to other parts of the region, and who will wish to make recreation and social trips on an ever-increasing scale; regional rail or transit services will be suitable in only a relatively small portion of these trips. Also it would be unfair to the residents because it would be impossible to prevent outsiders from using their cars within North Pickering.

One approach might be to tax drivers according to the use they make of the road system. While the technical means of doing this may now be close at hand, it is obvious that such a step cannot be taken only in one very small sector of the Province.

It would be unwise to contemplate building an inadequate, minimal roadway system on the theory that automobile use automatically will be discouraged. There seems to be little evidence that this, in fact, happens and in any event the provision of a proper level of roadway service is an essential part of permitting North Pickering to grow and develop soundly. Roads are a fundamental part of its fabric, and even if it were assumed possible to remove a large number of automobiles, there still must be allowance made for such things as door-to-door deliveries, the operation of construction vehicles, taxi services, on-street transit services, school bus services, and ambulance and other emergency services.

A main concern is with the way automobile travel for work and business concentrates into a few hours during the morning and evening. The design of the community presents an unique opportunity to approach this problem in a positive manner. The excessive use of the automobile at these times can be attacked first of all, and perhaps most fundamentally, by concentrating land uses and mixing them in ways that diminish the need for non-pedestrian travel and encourage travel on foot. (Perhaps the overall need for travel may be lessened by the introduction of special audiovisual communications systems; however, there is some doubt as to whether the effectiveness of these systems in this respect will be all that is being claimed).

Secondly, the attractiveness of public transit can be materially increased by providing exclusive rights-of-way; by designing roadways with special lanes for transit use all day or during peak hours; by introducing dial-a-bus services in areas unsuitable or not yet dense enough for scheduled services; concentrating mixtures of land uses close to transit routes so that several markets can be taken care of by a single line; keeping walking distances for the majority of potential users to less than 1000 feet; providing comfortable, weather-proof shelters at transfer points and reducing waiting times; electronic and communication aids to help maintain high frequencies and short travel times; designing direct transit routes connecting major land uses and making the roadways less direct; and finally, by recognizing that there is no single form of technology capable of efficiently and economically meeting the many and diverse requirements for transit service in North Pickering. A whole array of proven technologies will have to be introduced, with each system put into its proper place in the overall scheme of things.

Reduction in congestion by staggered work hours and shorter work week

Such changes will not greatly reduce the relative use of the auto and public transit for work and business, but they may reduce the level of congestion on streets and in transit vehicles during rush hours.

The extent to which staggered work hours can be introduced will depend on the character of businesses and industries attracted to North Pickering, and the degree to which individuals and firms have need to communicate directly with each other. The effect of the shorter work week will be felt most in the added leisure time available and the way this generates more social and recreational travel. We may not be too far away from a period when the problems caused by social and recreational automobile travel will match the rush-hour problem of today.

TRANSPORTATION GOALS

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c) is compatible with, and promotes the development of desired land-use patterns, yet is flexible enough to allow for desirable change in transportation technology and minor variations in land-use development and transportation technology.

To these Goals could be added:

- . To develop a system which is in accordance with the Province's transportation policies.*

The first two Goals have significance in the regional context, while the last two are more related to the community development process.

3.3 SPECIFIC GOALS

The following Goals have been derived:

A. COMMUNITY DEVELOPMENT

The Transportation Plan should:

- 1. Ensure there is potential for growth in relation to community needs and for response to changes in direction.*

The importance of a sound transport system to the process of community development is evident. It will be important, therefore, that the system provides a firm base for economic and social growth during both the first phases and the later development of the community. However, because of the possibility of far-reaching changes taking place during the next decades, the transport system must also be capable of extension or alteration to respond to new socio-economic needs that may arise from time to time.

2. *Avoid over- or under-investment in transport facilities extending over significant periods of time.*

The construction of the community provides the opportunity for setting up a capital works program which realistically relates the level of investment in transport facilities to the scale of development and the specific needs of the community at any given point in time. This can be assisted materially by setting aside the land required for major transport corridors during the community design process, and constructing the particular facilities only when they are needed.

3. *Allow for a degree of flexibility such that advantage can be taken of changes or improvements in transport technology.*

It is difficult to anticipate the nature of future changes but by reserving transport corridors it will be possible to introduce new technology at a later date, providing it is beneficial to the community to do so.

4. *Make provision for efficient and properly located links with the regional networks.*

Interchange, transfer and change-of-mode facilities must be designed and situated so as to achieve the highest practicable degree of mobility in serving the individual and the economy of the area. Account will have to be taken, however, of feedback effects on adjacent land-use activities in choosing locations for the facilities. It will be important also that the links with regional networks do not encourage automobile through traffic - particularly airport-oriented flows - to pass through the community.

5. *Avoid or reduce harmful environmental impacts.*

The abatement of noise, vibration and pollution must be a fundamental consideration in the planning and design of transport facilities. This applies to the man-made and the natural environment, including aquatic systems such as the West Duffin and Little Rouge Creeks. The process should be seen as a positive one in that assistance can be given to the process of conserving and enhancing desirable features.

6. *Ensure that visual intrusion is kept to a minimum and that all facilities are in keeping with their environment.*
7. *Ensure there is economy in the use of land for transport systems.*
8. *Provide capability for co-ordination with other physical systems.*
9. *Ensure that the capital investment and the annual costs of transport systems are kept as low as practicable, and equitably distributed between government, taxpayers and the users, taking into account social and economic benefits.*

B. *INDIVIDUAL DEVELOPMENT*

The Transportation Plan should:

1. *Supply mobility to the individual in meeting daily his economic, social and recreational needs.*

The plan must ensure that all persons in the community have available for use a transport system that permits them to live their lives as fully as possible. This will include the serving of travel demands directed outwards to the other parts of the region and beyond.

2. *Ensure that the particular needs of the young, elderly and physically handicapped are met.*

To a large extent these significant segments of the population have been ignored in the development and operation of existing transport systems. Special provisions will have to be made in the design process to meet their needs.

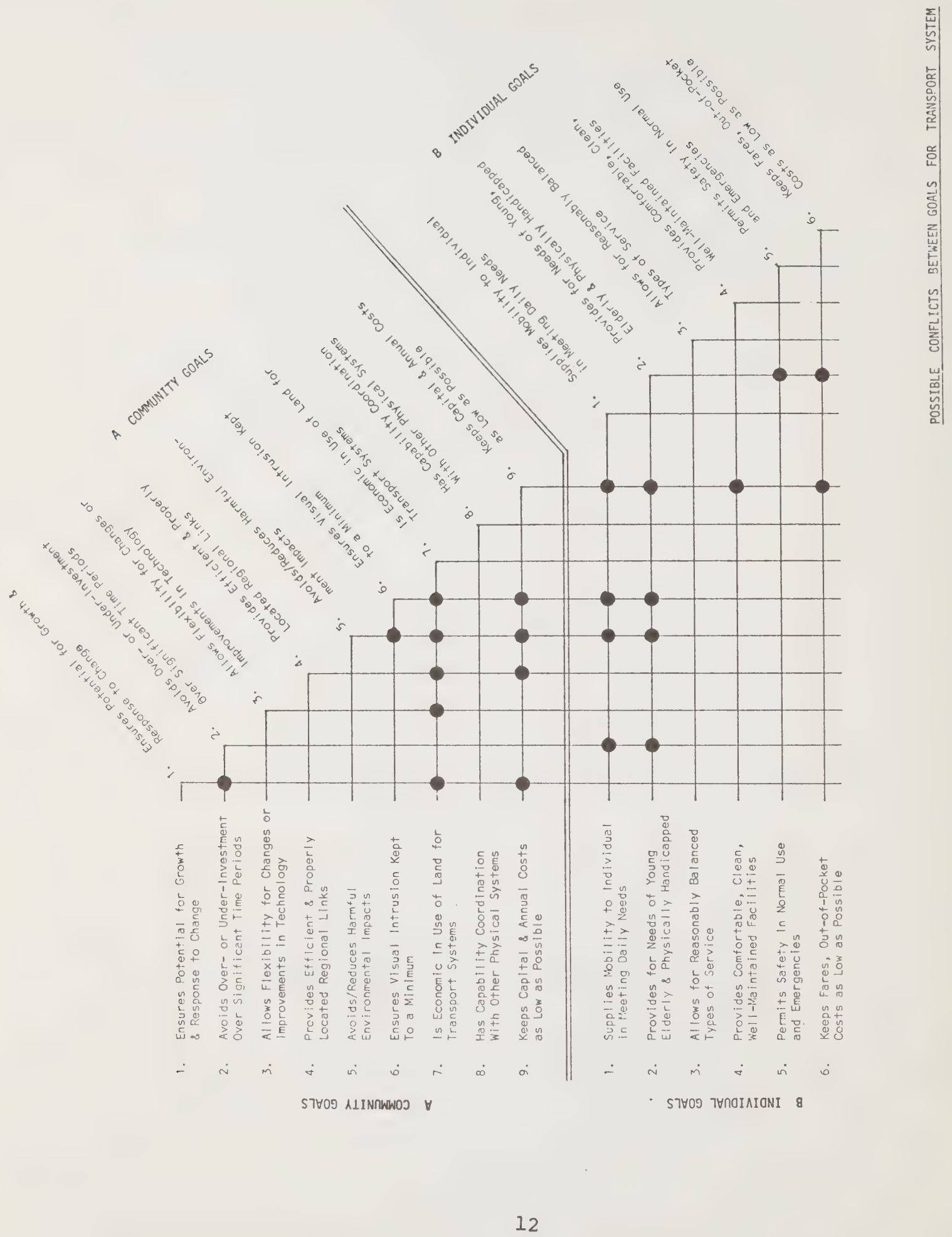
3. *Allow for reasonably balanced types of service.*

By "balance" is meant the provision of a level of private and public transport service which, to the maximum extent feasible and practicable, provides a choice to the individual in making his trips.

4. *Provide comfortable, clean, attractive and well-maintained facilities.*
5. *Make provision for safety in use.*

Design standards and operating procedures must maintain a high level of safety, both during normal operation and in emergencies.

6. *Ensure that fares or out-of-pocket costs are kept as low as possible.*



3.4 CONFLICTS BETWEEN SPECIFIC GOALS

Unfortunately it never is possible to satisfy all Goals equally because of inherent conflicts between them. This results in the need to accept trade-offs to some degree or another.

The matrix exhibit illustrates some possible conflicts. For example:

<i>Is Economic in Use of Land for Transport Systems (A.7)</i>	<u>Vs</u>	<i>Avoids/Reduces Harmful Environmental Impacts (A.5)</i>
<i>Provides for Needs of Young, Elderly and Handicapped (B.2)</i>	<u>Vs</u>	<i>Keeps Capital and Annual Costs as Low as Possible (A.9)</i>

It should be noted that the extent to which conflicting Transportation Goals can be satisfied depends also on the compromises that have to be made with Community Design, Social Development and other Goals.

**ANALYSIS of
PRELIMINARY
LAND-USE CONCEPTS 4**

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4. ANALYSIS OF PRELIMINARY LAND-USE CONCEPTS

4.1 SUMMARY

The work program consisted of:

- a) An analysis of alternative generalized land-use schemes to determine their relative efficiency from a transportation standpoint.
- b) An analysis in some detail of certain alternative land-use concepts for development of the community.

4.2 EFFICIENCY OF LAND-USE FORMS

This work was undertaken quite early in the project. While it has always been recognized that the selected urban form(s) will be synthesized as a result of consideration of a large number of different factors, the purpose of this examination was to determine which forms appeared best in terms of minimizing internal travel. Eight very simple land-use schemes were analyzed. These differed to the extent of:

- . location and strength of the town centre (expressed as the percentage of total local retail and service employment). One scheme had no town centre.
- . distribution and strength (percent total retail and service employment) of regional and district centres.
- . concentration or dispersion of manufacturing sites and number of jobs.
- . population distribution, magnitude and density.

Table No.1 summarizes the schemes that are illustrated diagrammatically on the following pages.

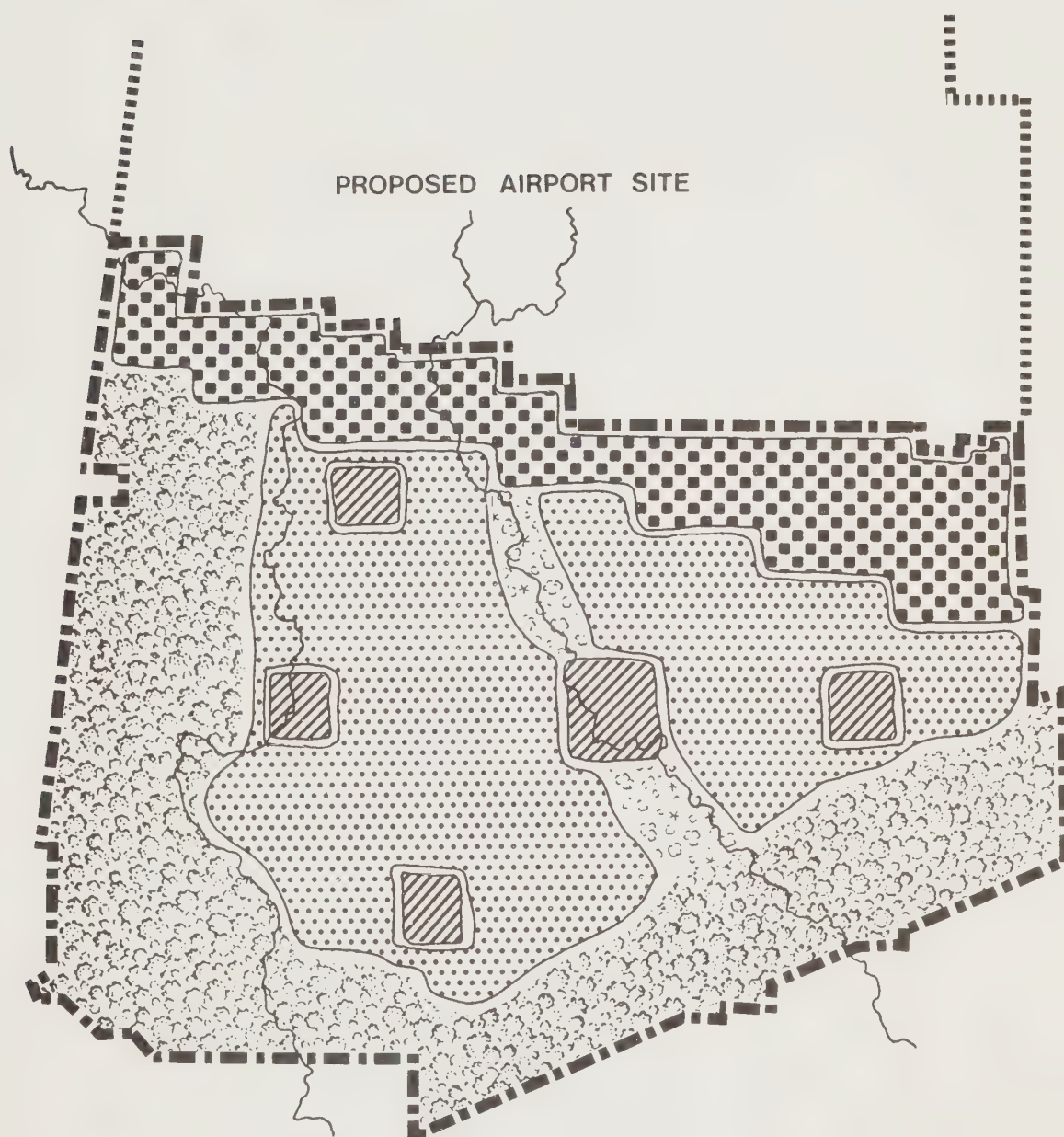
Procedure*






It was decided that relative transportation efficiency would be assessed on the basis that only internally-generated trips would be considered, and all these journeys would be assumed to have destinations within North Pickering. Trips were generated for work and for non-work purposes, and distributed to all internal zones using a simple distribution model. The resultant 24-hour person trips were assigned to transportation networks based on two different modal splits for public transit. The networks were developed specifically for each land-use scheme taking account of the magnitude and distribution of activities and major environmental constraints. Each land-use scheme was then described and scored according to measures such as:

- . total 24-hour person-kms travel (work only)
- . total 24-hour vehicle-kms travel by auto and public transit
- . total kms arterial street
- . total lane-kms arterial street (Level of Service 'C')

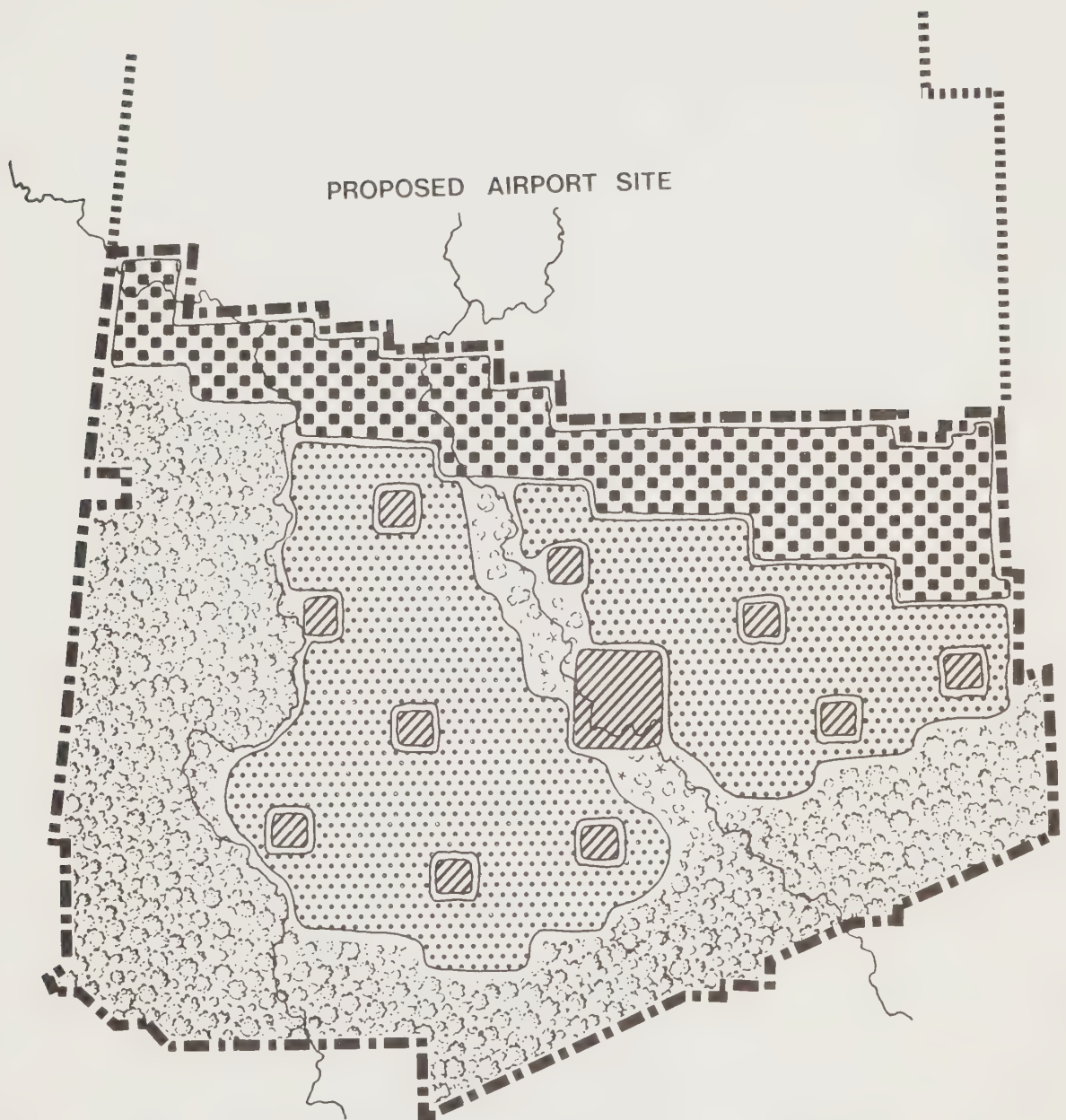
Modal split was based on the proportions of 90-10 and 50-50 (automobile to public transit use). It was considered that the 90-10 ratio would reflect fairly typical all-day, area-wide urban conditions, while the 50-50 ratio might be the best that could be achieved under community design conditions most favourable to public transit.






* For a full description of the procedure used, reference should be made to Note on Study Design, October 4, 1973, Plantown Consultants Limited (Transportation Co-ordination Area)



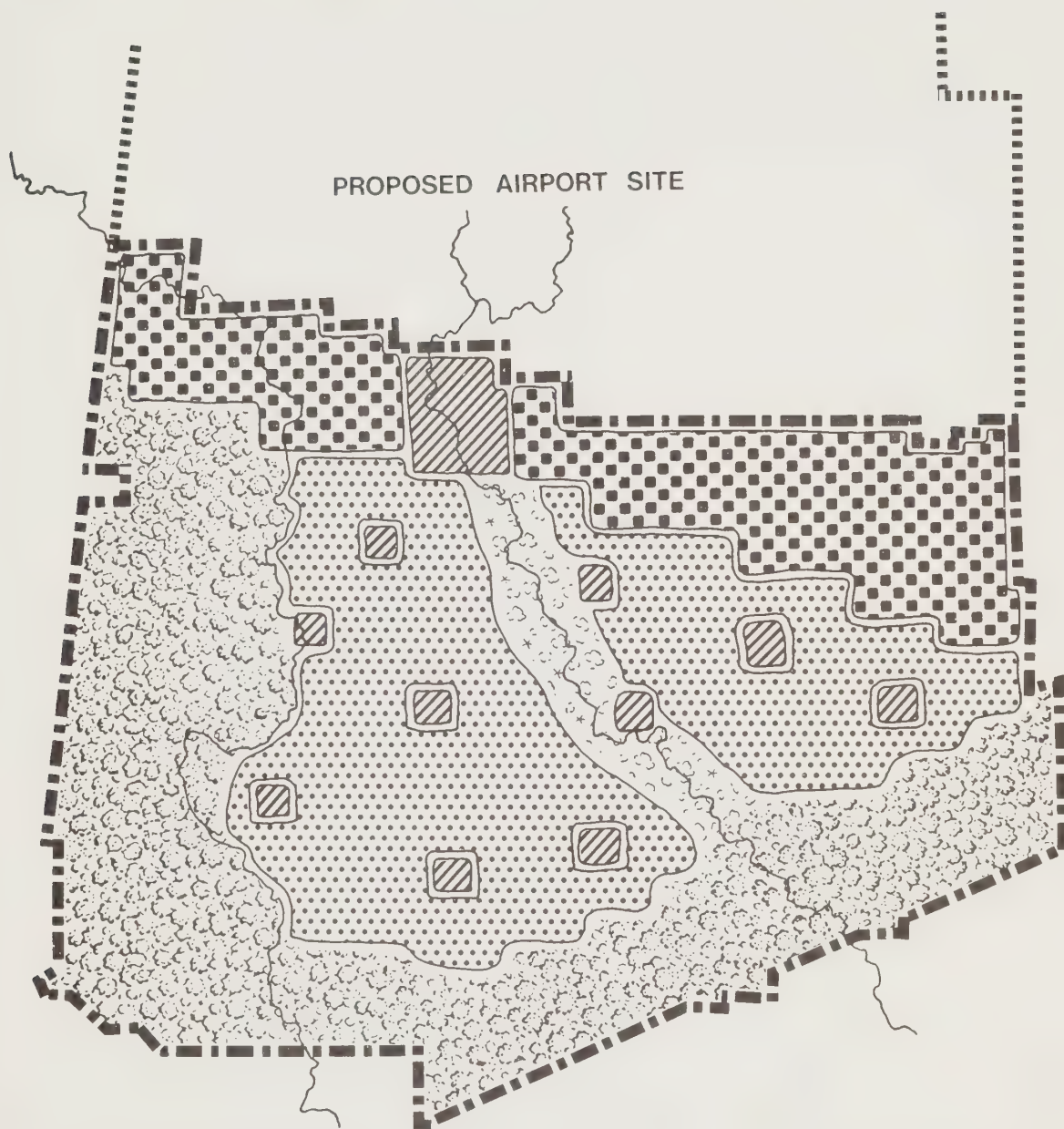
- site boundary
-  open space system
-  major community open space
-  residential
-  industrial
-  commercial






SCHEME 1



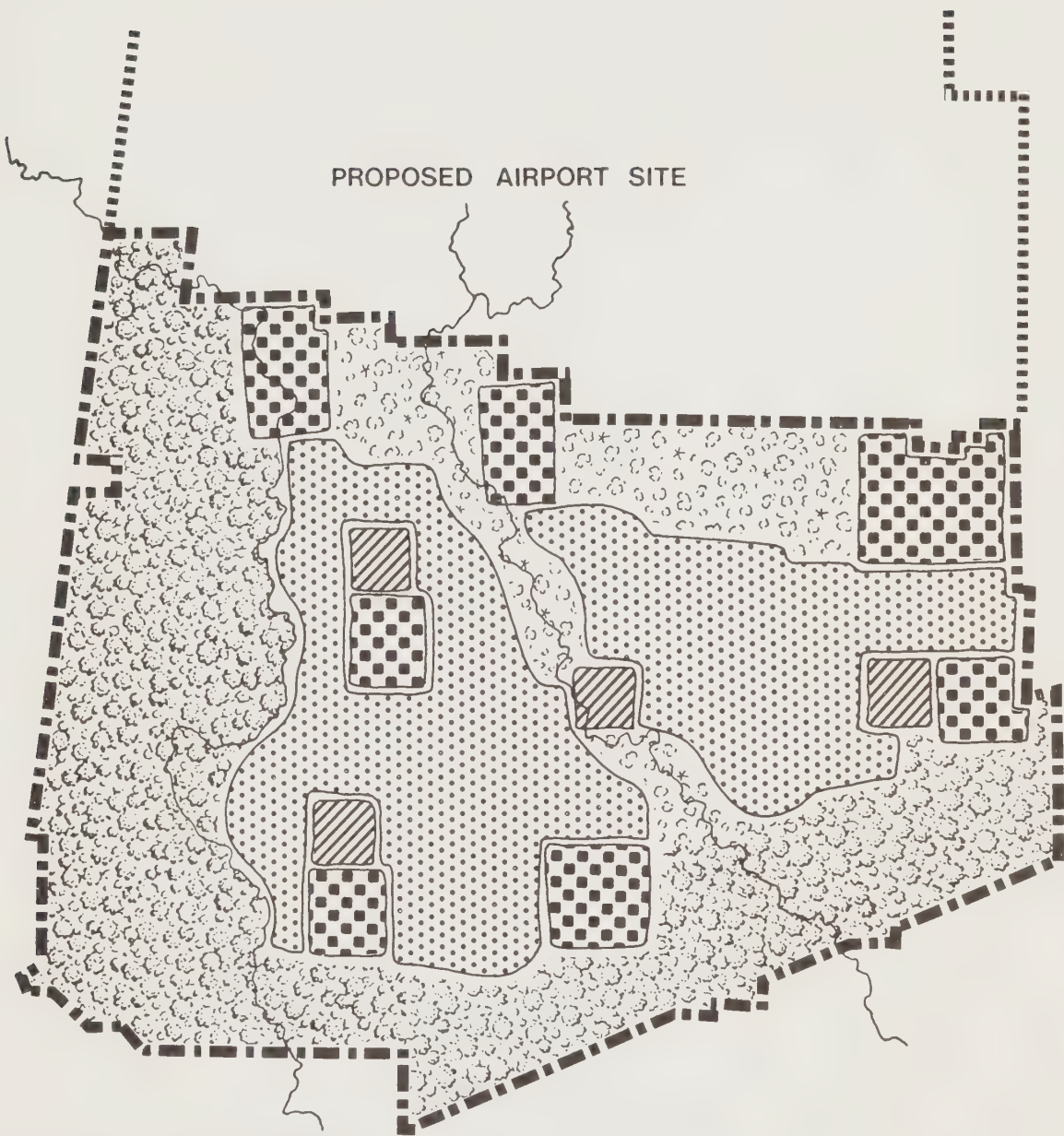
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-  industrial
-  commercial






SCHEME 2



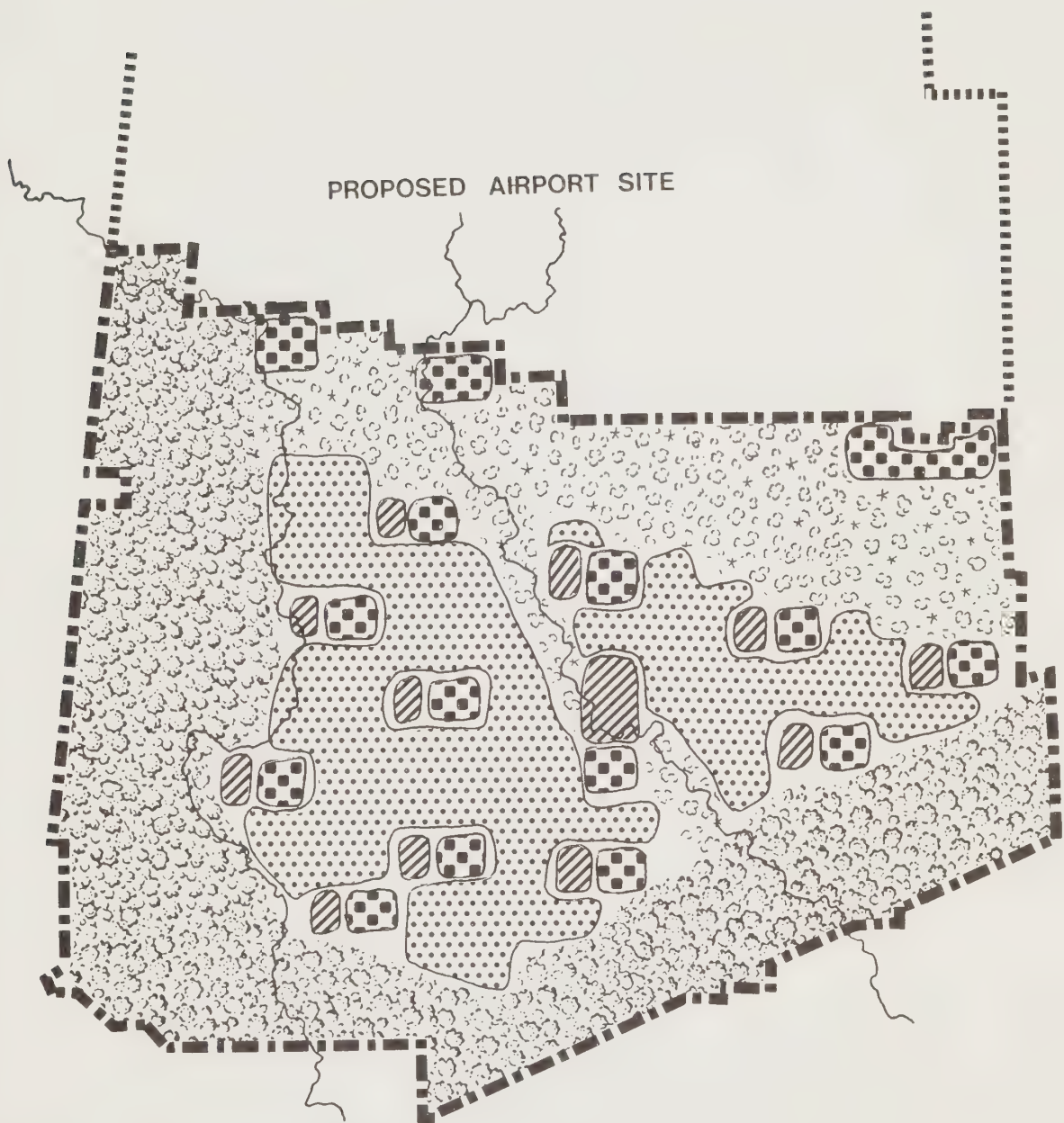
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-  major community open space
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-  industrial
-  commercial






SCHEME 3



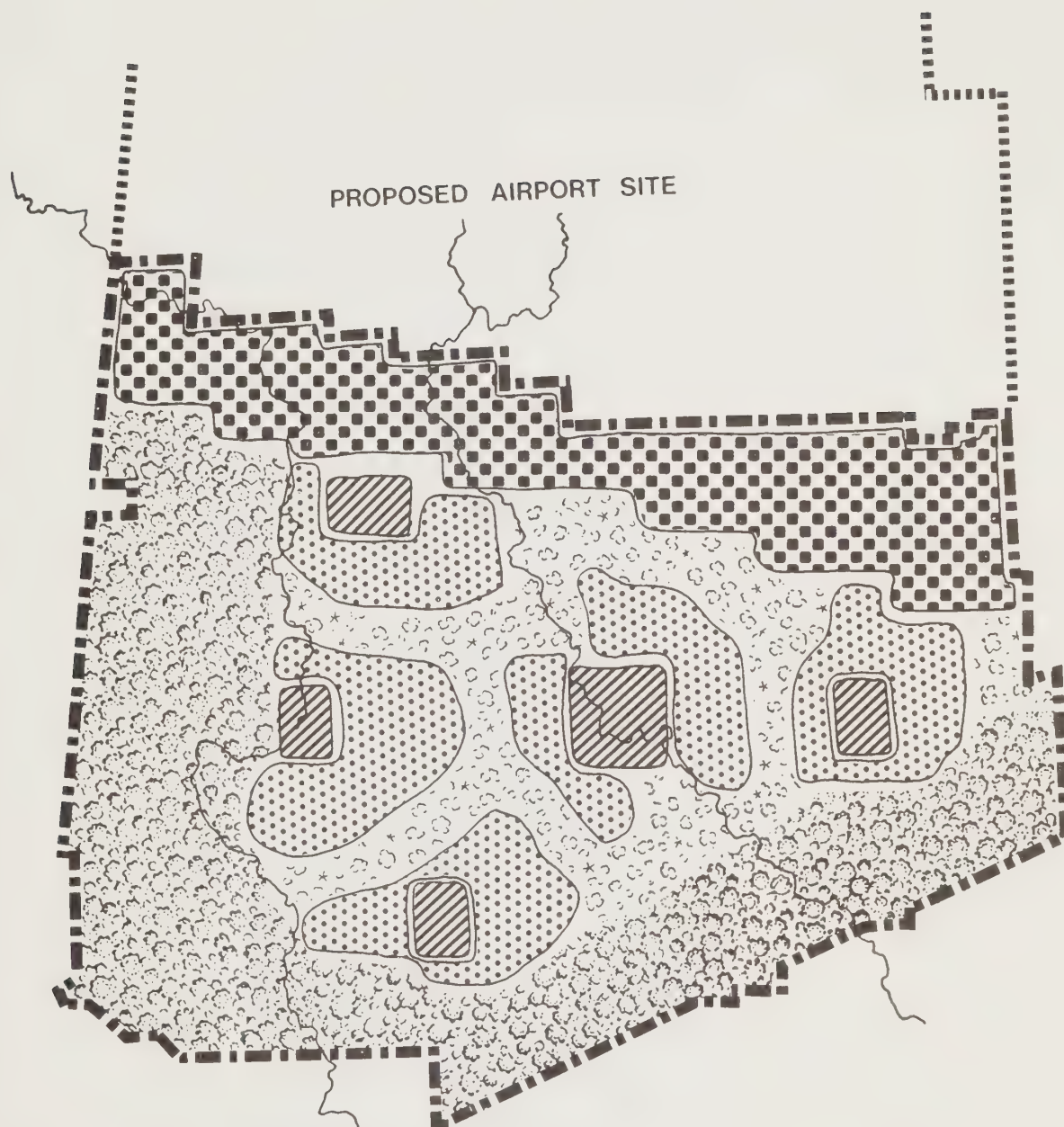
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-  major community open space
-  residential
-  industrial
-  commercial






SCHEME 4



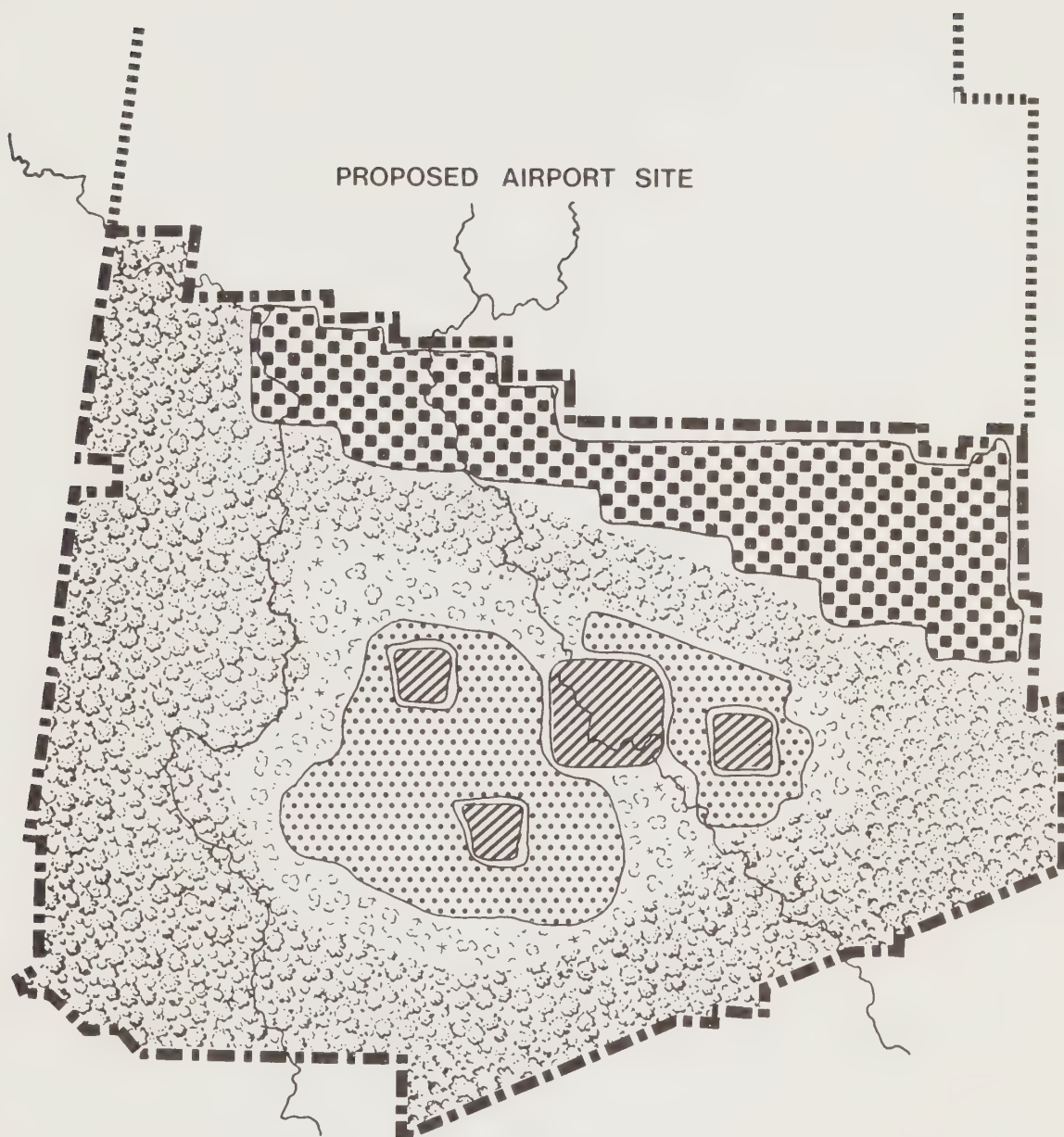
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-  open space system
-  major community open space
-  residential
-  industrial
-  commercial






SCHEME 5



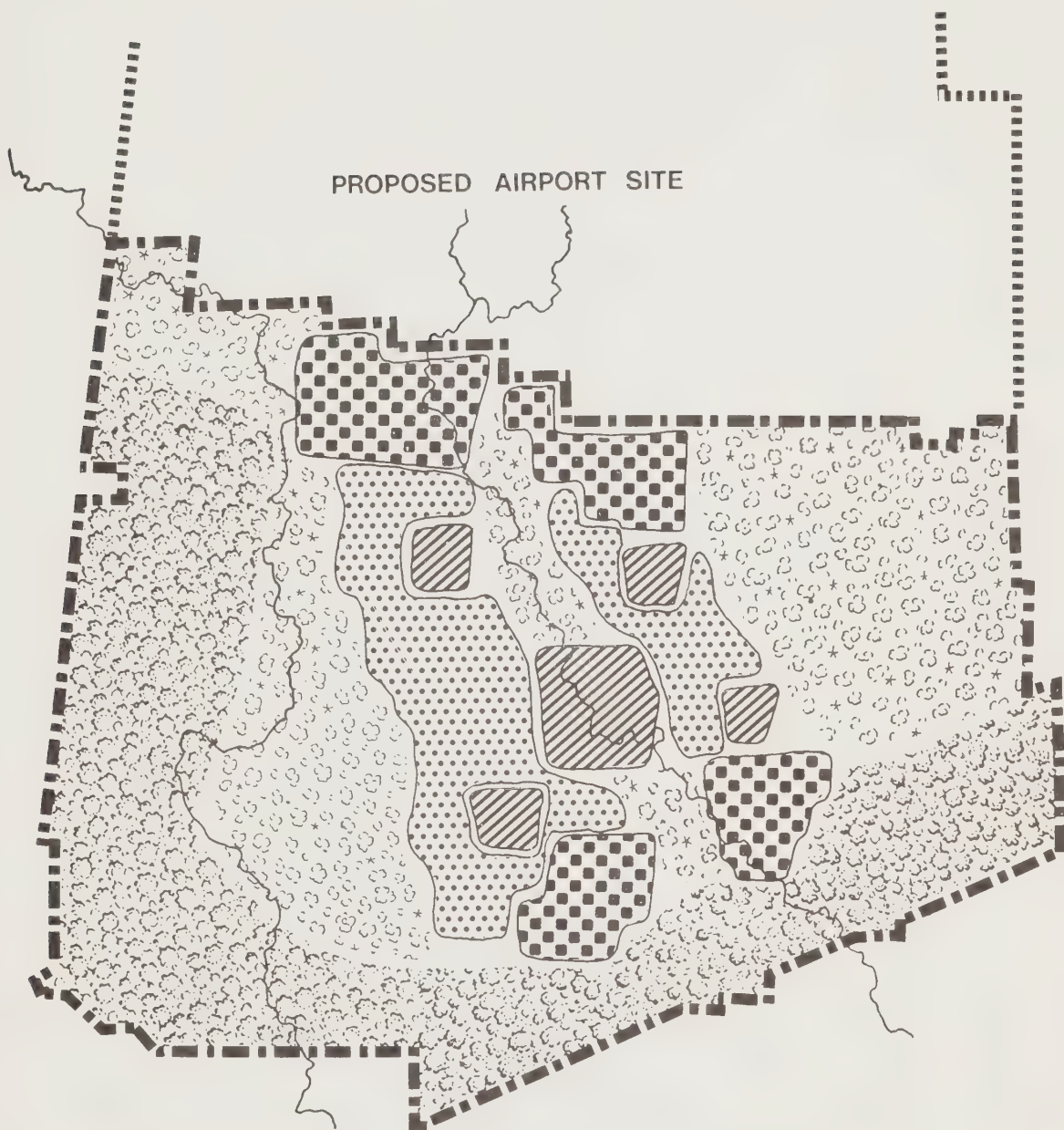
- site boundary
-  open space system
-  major community open space
-  residential
-  industrial
-  commercial






SCHEME 6



- site boundary
-  open space system
-  major community open space
-  residential
-  industrial
-  commercial

SCHEME 7



- site boundary
-  open space system
-  major community open space
-  residential
-  industrial
-  commercial

SCHEME 8

TABLE NO.1 - ANALYSIS OF ALTERNATIVE LAND-USE FORMS

SCHEME	TOWN CENTRE		OTHER CENTRES			MANUFACTURING	POPULATION	REMARKS	TOTAL SCORE	OVERALL RANKING
	Character	% Retail Service	Centres	% Retail (Each)	% Service (Each)					
1	Strong	25	75	75/4	15/4 (10)*	Conc.- Noise Lands	Even Dist.		118)	6)
2	Very Strong	50	50	75/10	25/10	Conc.- Noise Lands	Even Dist.))
3	Very Strong	50	50	75/10	25/10	Conc.- Noise Lands	Even Dist.		111)	5)
4	None	-	-	100/4	90/4 (10)	Dispersed - 7 Sites	Even Dist.	Same as #2 but Town Centre in Noise Lands	167	8
5	Weak	25	25	75/11	75/11	Very Dispersed: 4 Large and 11 Small Sites	Even Dist.	Some Noise Lands Open Space/Recreation	130	7
6	Strong	25	75	75/4	15/4 (10)	Conc.- Noise Lands	Conc.: 35% around T.C.; Balance 4 Sectors	Noise Lands Mainly Open Space/Recreation	90)	3)
7	Very Strong	50	50	25/3	25/3	Conc.- Noise Lands	Very Conc.- T.C.	Same as #1 but for Population))
8	Strong	25	75	75/4	15/4 (10)	Conc.- 4 Sites at Extremes	Conc.	Open Space/Recreation Separating Manu. from rest of Site	46	2
								Linear	24	1

* 10% distributed throughout residential areas.

Findings*

The last two columns of the table indicate the scoring and ranking of the eight schemes.

The most efficient schemes were those with very concentrated land-uses across all classes, namely Schemes 7 and 8. Scheme 8 was linear in form and 7 was the same for all practical purposes. The worst schemes were those which had dispersed land uses. Scheme 4, for example, had four subregional centres in place of a town centre and dispersed manufacturing. The reason for Scheme 3 ranking the lowest in spite of a very strong town centre and concentrated manufacturing, is that the town centre was located on the northern limit beside the boundary of the proposed Airport.

In the case of the 90-10 modal split the average amount of transit use was 200,000 passenger-kms of travel per day; in the high modal split situation it was 1,000,000 passenger-kms. Obviously the results simply reflect the ratios selected, but the illustration does serve to show the magnitude of the change as greater transit use is attained, and there are important implications with respect to the size and scope of a public transit agency serving North Pickering.

Obviously, North Pickering's relation to the Central Ontario Region is going to set up considerable travel interchanges between it and the surrounding areas, particularly for work purposes. The extent to which such travel can be encouraged to use regional transit systems will depend on the nature and extent of the facilities provided, both in the short term and the long term. Nevertheless, in terms of internal travel great opportunities exist in the planning of the community to integrate

* *Presented in Plantown Memorandum:
Analysis of Land-Use Forms, November 30, 1973 (Transportation Co-ordination Area)*

transit with every day living in a way not possible in existing communities. While the work trip traditionally is considered the prime market for transit service, it may well be that, under the right conditions, non-work travel throughout the entire day will present similar opportunities.

As a final note, it should be pointed out that the differences between land-use schemes in terms of relative travel efficiency were often quite considerable. Whatever the particular indicators used, the worst land-use schemes were generally in the order of 50 percent less efficient than the best ones.

4.3 ANALYSIS OF LAND-USE CONCEPTS

This analysis has been the focus of the transportation planning work for many months. To date, five examples of alternative land-use concepts have been evaluated with regard to the nature of the transportation systems each requires to achieve the objectives set down by the community planners. Further alternatives are being evaluated as they are developed.

Background

Fairly detailed information has been provided concerning the distribution and density of population and employment opportunities, and the character of the town centre and shopping, commercial and manufacturing areas. For the purpose of protecting transportation corridor options all concepts have been studied on the basis of the very preliminary assumption of an end-state total population of 200,000 and a total of 60,000 jobs available on-site. To appreciate the extent of the transportation facilities required under the "worst" conditions, i.e. predominantly automobile use, all analyses have been made assuming a very low modal split in favour of transit, (e.g. for work purposes: 13 percent internal, 13 percent in-commuting, 8 percent out-commuting).

However, before commencing the travel simulation analyses for each concept, the community had to be placed in its regional travel context. This was done by taking some of the assumptions and findings from the Toronto and Region Model Study (T.A.R.M.S.) being undertaken by the Ministry of Transportation and Communications, and revising the information where necessary to reflect the higher end-state population and job totals for North Pickering being used here.

Findings

The most significant findings resulting from the regional scenario - this is common to all alternative concepts - is the absolute dominance of journeys in the evening peak hour made between North Pickering and other parts of the region. These amounted to 29,000 trips as compared to only 8,700 trips made internally in North Pickering, and 2,800 trips between North Pickering and the proposed Airport during the same time period. Another 26,000 trips were found to be passing through the community, attracted mainly by activities at the proposed Airport. Obviously, inadequate provision for these through movements on the regional network will have serious consequences for North Pickering as well as adjacent communities.

On the basis of the TARMS assumptions, the nature of these movements described requires emphasis be given to links with the proposed regional road networks. The high commuting patterns indicate that the zones generating the major regional vehicle movements - the industrial zones and the town centre - should be easily accessible from the regional freeway network. Other regional trips originating in or destined to North Pickering must be satisfied by the various arterial entry and exit points on the periphery of the community to allow for their distribution. The major vehicle flows in the P.M. peak hour are to and from the west (Metro Toronto) and the south (East Scarborough, Ajax and Pickering). Hence, the arterial connections from these areas play a very important role in the distribution of the dominant commuting trips.

Demand between the Airport and North Pickering in the P.M. peak hour is catered for by the two possible north-south freeway connections (the East Metro Freeway and the Brock Road Freeway) and an arterial connection crossing Highway 7.

Because of the overwhelming significance of in- and out-commuting and airport trips in the peak hour, the analysis of the alternative land-use concepts has disclosed as much in the way of similarities as in differences between them. The large travel demands from the west and south of the community coupled with the distribution of a good proportion of total jobs and population on the east side of West Duffin Creek result in the need for several sizeable crossings throughout the length of this environmentally-sensitive area. This is true regardless of the concepts being evaluated; where differences exist, they generally take the form of there being a need for a couple more or fewer traffic lanes in certain locations across the Creek. The location, engineering feasibility and cost of West Duffin crossings has been the subject of a special evaluation undertaken with the community and environmental planners.

To try to overcome this problem, network changes were made to encourage more internal/external and certain through trips to use Highway 7 and proposed Highway 407. The results indicated there would be a more balanced network of freeway and arterial facilities regionally, but the problem of several crossings of West Duffin Creek still remained. A study has begun of the nature of the environmental effects produced by the crossings and how these may be reduced or eliminated by proper design and maintenance procedures.

One of the concepts differed radically from the others in that some of the services and employment opportunities traditionally associated with the town centre were distributed throughout several parts of the total community. This, coupled with a finer network of roads, resulted in a more balanced internal arterial road system, in that most were in the

order of four or six lanes. By contrast, the other land-use transportation concepts produced several arterial sections of eight or more lanes. However, the problem of West Duffin Creek appeared to be little diminished.

In summary then, the problems discovered to date are due more to the strong relationship projected between North Pickering and the Central Ontario Region (including the proposed Airport) than for reasons of purely internal demands for travel. Radically different regional assumptions can, of course, be made but whether these have any validity must be a subject for further evaluation and analysis in the course of examining other land-use concepts. This analysis continues and will be the subject of a special report when complete.

**PLANNING
for URBAN
GOODS MOVEMENT 5**

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5. PLANNING FOR URBAN GOODS MOVEMENT

5.1 INTRODUCTION

An examination was made of the opportunities presented in planning a new community to eliminate or reduce the problems commonly associated today with the movement of goods in urban areas. Some of the issues involve the efficiency and economy of freight and delivery operations; others are concerned with noise, pollution and general disturbance to the community at large.

An extensive literature search was conducted and meetings were held with a number of authorities in this field. When the information had been collated and analyzed, a summary report of the research findings was prepared. This was presented and discussed at a special seminar attended by representatives of Canadian Pacific Railway, Canadian National Railways, the Automotive Transport Association of Ontario, members of the Transportation Special Interest Group, North Pickering Project and Plantown. Presented herein is the consensus that emerged from the discussion. While certain points made are associated more with the community design process, many others have direct relevance to the present planning process and are constantly being taken into consideration. The summary report of the research findings is contained in Appendix 'A'.

5.2 CONSENSUS

- . The disturbing effects of trucks in urban areas are generally overstated. Noise pollution and other negative effects of trucks are relative, and are probably not objectionable to the majority of the residents of any area. The problem, if it exists, is that of through truck movements and should be taken care of during the community planning process.

- . The type and scale of future trucking will, to a large degree, depend on the type of land development occurring in North Pickering. Population densities, the type of industries and the role of the community are among the factors which will influence the amount of trucking. Trucking for construction purposes will also be a factor, perhaps, a very important one when taken in conjunction with the construction of the proposed Airport.
- . It may be difficult to minimize duplication among competitors. Retailers, among others, value the "personal" contact made when goods are delivered by company trucks; this may come to be the only contact with the increasing trend toward catalogue shopping.

There are some indications, however, that direct shipping from manufacturers and warehouses is also becoming more widespread. It was noted that consolidation of freight may increase shipping costs because of the extra goods handling required.

- . With respect to Central Shipping and Receiving Areas it has been found that greater efficiency is not always achieved since each participant in goods movement tends to minimize his own costs. It is important in optimizing the industry to determine who pays what portion of the total shipment cost, but this type of information is difficult to obtain.
- . Night-time deliveries are a possibility in the North Pickering Project. Past experience has been that the negative reactions in other applications came not from the goods transport industry but from shopkeepers and merchants who had to provide access to their establishments during the night. This could be a significant restraint.

- . The industry has made some progress in adopting standard sized containers (8' x 8' x 20' and 8' x 8' x 40'). Standard sized pallets and common freight banding systems have not been developed as these vary to accommodate commodity.
- . The locating of freight generators in relation to the transport system is vital for efficient goods movement. However, goods movement considerations must be studied in conjunction with the planning of other land-use requirements.
- . The question of whether rail service is needed for certain industries is mostly a matter of comparing trucking and rail shipment costs. It was agreed that a choice of rail service should exist for a concentrated industrial area in the community.
- . Evident trends in the rail industry indicate that the rail share of the market for transporting manufactured goods may be increasing. Higher fuel costs may favour the use of rail for future goods shipment. Expansion of the rail industry is being hampered by shortages of equipment and the heavy investment needed in plant facilities.
- . The following trends are evident in the trucking industry:
 - increasing use of piggybacking,
 - ability to meet rapidly increasing volume of business being constrained by lack of facilities,
 - acceptance of smaller scale suburban terminals rather than larger central terminals, and
 - increasing pooling of freight shipments.

- . There already exists much cooperation between the rail and the trucking modes, and between the railway companies. Common facilities for the railways could be considered in North Pickering.
- . The use of rapid transit for goods transport does not seem feasible.
- . Positive truck route signing can be useful in minimizing environmental impacts. Enforcement of the use of a truck route system will be difficult unless the advantages are evident to the industry.

5.3 DISTRIBUTION CENTRE AND TRANSSHIPMENT FACILITIES

Another issue bearing on North Pickering's development character is whether there will be consideration of a distribution centre and transshipment facilities associated with an air-cargo terminal at the proposed Airport. A distribution centre would consist of common-user warehouses with pickup, minor manufacturing, assembly and delivery services. Transshipment facilities would provide modal interface for intercity movements of freight, and access to rail services as well as regional highways would be an integral part of such an operation. There may be opportunities here for development of such facilities in the noise lands just south of the Airport boundary in conjunction with the relocation of the railway line and the Province's plans for Highway 407. However, any decisions in this regard must await the findings of the Royal Commission on the Airport.

STATUS of TRANSPORT TECHNOLOGY 6

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6. STATUS OF TRANSPORT TECHNOLOGY

6.1 INTRODUCTION

As part of the program a special study was carried out to evaluate the situation with regard to current transport technology. The findings and conclusions are presented in Status of Transport Technology, Plan-town Consultants Limited, May 1974.

6.2 PUBLIC TRANSPORT SYSTEMS

It is estimated that over 300 proposals have been put forward for new transport systems within the past ten years. Most of these proposals are simply ideas in sketch form which will require large expenditures of time and money to bring to a dependable operating stage. The time scale proposed for the development of North Pickering indicates that only those systems which are available now or within the next five to ten years can be considered. The report, therefore, focuses on those systems that have either demonstrated operating success or appear to have the potential for implementation within the short range.

Twenty-three systems were selected for evaluation. All were considered to be feasible from a technological viewpoint, although no rigid conclusions were attempted from the standpoint of capital and operating costs and other important factors which must eventually be part of the analysis.

Figure No.1 shows the development status of these systems. The terms used for describing the status of development are:

. PROPOSAL

A proposal has been put forward by the developer for a system.

It may represent a substantial amount of research and engineering in preparing the proposal.

- . OPERATING MODEL

This means there is an operating model which shows the principles on which the system is based. The model may or may not carry passengers.

- . DEMONSTRATION VEHICLE

In this stage is demonstrated the passenger-carrying ability of the system over a short section of track.

- . PASSENGER-CARRYING SERVICE

Systems shown reaching this stage have carried passengers on a relatively regular basis in fair grounds, at airports or other similar applications.

- . PUBLIC TRANSPORTATION SERVICE

Public transportation is a heavy-duty application demanding a high degree of reliability. The demands imposed by public service are in excess of those imposed by a system operating in a fair ground or in private service.

- . PROVEN RELIABILITY

Systems included in this status level have a proven record in public transportation service.

DEVELOPMENT STATUS OF PUBLIC TRANSPORT SYSTEMS

Figure No. I

SYSTEM NAME	No.	PROPOSAL	OPERATING MODEL	DEMONSTRATION VEHICLE	PASSENGER CARRYING SERVICE	PUBLIC TRANSPORTATION SERVICE	PROVEN RELIABILITY
ACTIVITY CENTRE	1						
AIRTRANS	2						
ALDEN PRT	3						
DASHAVEYOR	4						
DUORAIL — Rubber Tire	5						
TRANSIT EXPRESSWAY	6						
ALWEG	7						
WABCO	8						
MONOCAB	9						
SAFEGE	10						
MINITRAM	11						
DUORAIL — Steel Wheel	12						
LIGHT DUORAIL	13						
CABINENTAXI	14						
GO - URBAN	15						
TTI	16						
UNIFLO	17						
URBA	18						
UNGUIDED BUSWAY	19						
GUIDED BUSWAY	20						
BATTERY BUS	21						
PASSENGER CONVEYOR	22						
SPEEDAWAY	23						

The development status given is the present-day position. The time that will be required for the newer systems to reach the status of Proven Reliability is difficult to anticipate. This depends on success in solving problems, making large expenditures of money and showing willingness to adopt a system at a lower status level and move it up the scale.

As can be seen, only six systems have reached the point of Proven Reliability. They are:

1. Duorail - Rubber Tire (e.g. Montreal Subway)
2. Alweg Monorail
3. Duorail - Steel Wheel (e.g. Toronto Subway)
4. Light Duorail (Modern Streetcars)
5. Unguided Bus
6. Passenger Conveyor

It needs to be emphasized that modern Streetcars and Buses are considerably more advanced and attractive than the vehicles commonly in use today. Great attention is being paid to the reduction of noise and air pollution, to the provision of more efficient ways of using energy, to greater comfort for the passenger through improved seating, entrance/exit facilities and fresh-air systems, and to greater safety. When these advances are coupled with the increasing acceptance of the use of reserved rights-of-way and lanes wherever possible, it becomes clear that Streetcars and Buses do provide excellent opportunities for a transit system offering a wide range of passenger-carrying capability under a variety of operating conditions. The Duorail systems are generally considered practicable only in large metropolitan areas.

The Alweg Monorail is not considered to have any special benefits for application in North Pickering, and Passenger Conveyors are suitable for use only in special areas, such as a town centre.

In sum, then, the recommended systems for area-wide internal service within North Pickering are modern buses and streetcars. The buses may operate in reserved rights-of-way, in special lanes within roadways, or mixed with general traffic. Services may be on a scheduled basis or as part of a dial-a-bus system. Streetcars should be operated only in reserved rights-of-way. An essential feature of the overall planning process will be to set aside rights-of-way to ensure that regardless of the systems used today or in the future, proper provision will have been made for them to be incorporated into the community.

As far as regional transit links are concerned and the type of system selected, the situation is unclear at the moment. Much depends on the needs for service to the proposed Airport and whether advantage can be taken of such a requirement to bring the system through North Pickering. In doing so it is clear that it could not function as a local service; probably only two or perhaps three stations could be allowed at focal points such as the town centre and major commercial, industrial and institutional concentrations. Again, in the absence of any firm decisions it appears beneficial in this stage of planning the community to set aside a right-of-way. There is no reason why this could not be shared in part with a local system for internal service.

6.3 PRIVATE TRANSPORT

In the foreseeable future the private automobile will continue to be the favoured form of transport. The problems experienced today of noise and pollution may be diminished considerably as a result of the present-day research as touched on below. Problems of traffic congestion can be tackled only in the context of vastly improved public transport services coupled with land-use development concepts that place transit in a more favourable position than heretofore has been possible, and which even reduce the need for travel on any type of vehicle for some sorts of journeys. However, when the significance of travel movements between North Pickering and the rest of the region is taken into account it will be appreciated that policies determined for application to internal situations will not always be sufficient to reduce congestion.

Technical improvements can be expected in the development of the private car. These will undoubtedly include lower noise levels, smaller size and reduced air pollution. Shrinking petroleum reserves will result in a drive towards greater fuel economy. With improvements in engine design and vehicle body design, a greater proportion of vehicle size can be expected to be given over to the passenger compartment and less to the engine compartment and structural parts of the vehicle.

A great deal of research is being carried out on the development of high-energy batteries. The benefits of battery operation lie in rugged motor construction and reduced fuel costs by the use of electrical energy in place of liquid fuels. At the present time the batteries are large and take up a substantial amount of room. Batteries require recharging periodically and we are likely to see the advent of battery changeover stations where the entire battery would be removed and a fully-charged battery installed. The removed battery would then be put on charge for installation in another vehicle. A battery charger at the individual's home would allow charging to take place overnight.

Research is going on in the field of fuel cells which derive energy in an electrical form by chemical reaction. Demonstration fuel cells are in operation, but at the present time, size and the cost of the cells do not permit their commercial use. Fuel cells powered by hydrogen may come into use. There are many problems yet to be solved in the storage and handling of hydrogen in an individual vehicle.

**A SUMMARY of
RESEARCH FINDINGS:
PLANNING for URBAN
GOODS MOVEMENT**

APPENDIX

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INTRODUCTION

To date our understanding of urban goods movement is limited. However, there seem to be areas where early planning can eliminate many inefficiencies presently existing in the industry. This report, prepared by Plantown Consultants Limited for the North Pickering Project, is an attempt to indicate present conditions in the goods movement industry and to identify the most important issues of relevance to the planning process.

Considerable variation occurs in goods movement, including the commodities transported, the modes used, the methods of goods handling and the purposes and the types of trips. Movement is highly fragmented by reason of the numerous origins and destinations involved and their dispersed locations.

Unplanned goods movement can be disruptive to person travel and disturbing to the environment. For example, trucking can be a nuisance to pedestrians and to car drivers in core business areas where there exist restrictive conditions. Most environmental effects of trucking today are negative. Truck freight movement is a significant contributor to both air and noise pollution.

However, efficient urban goods movement is a major and positive contributor to the economy. It is estimated that the transportation industry in Canada (excluding private trucking) contributes over 7% to the Gross Domestic Product. The cost of freight movement is also reflected in the cost of consumer goods, which generally include an estimated 20% for transport costs.

There are indications today that the goods movement industry is not operating in an optimum manner. The industry is relatively labour-intensive and, therefore, will likely increase in cost disproportionately to other industrial and commercial costs. Numerous companies often provide essentially the same services (both for-hire and private trucking) in one area.

MAJOR ISSUES

1. Disturbing Effects

Truck transportation in the form of heavy trucks is usually disruptive to the movement of automobiles. This typically occurs in central commercial areas where conditions are often complicated by trucks parked at the curbside for loading and unloading purposes.

Trucking often causes negative effects to the environment in the forms of air and noise pollution and these are most noticeable when heavy trucks traverse residential areas.

2. Duplication of Service

In urban areas, pickup and deliveries of numerous small shipments are often made by independent operators (both for-hire and private). Consolidation of small shipments and consolidating some services may result in improved and more economical service for the Community.

3. Peaking

The peak of truck deliveries to core areas now typically occurs at

about 10-11 in the morning with a secondary peak at about 2-3 in the afternoon. Thus, many deliveries are concentrated into short-time periods. A partial solution to peaking problems may be night-time deliveries.

4. Goods Handling

Goods Handling - the process of preparing goods for shipment, transferring between and within modes, and completing the shipment to its ultimate destination is currently extremely labour-intensive. Among the possible improvements are common palletization, standard size containers and increased automation of terminals and storage areas.

5. Land-Use Planning

As is the case with person travel, the allocation of land-use activities is of critical importance to achieving efficient intra-urban and intercity goods movement. The movement of freight and goods between numerous highly-dispersed urban locations contributes to a less than optimum goods movement system today. Major freight operators should be located so that the length of the freight movement patterns are minimized. In general, heavy industry should be located adjacent to trunk transport services such as railways, pipelines and freeways, and light industry should be located close to freeways and arterials.

6. Overall Transportation System

A balanced and integrated road system is needed to serve a variety of truck trip purposes and trip lengths. In the central business

area and special precincts of North Pickering, goods movement by truck should be separated physically from pedestrian and automobile travel.

Rail route location and relocation should be studied in conjunction with land-use planning. The routes should not pass through residential areas but should be relatively close to areas of heavy industry. Certain industries are dependent on rail access.

7. Potential Future Transport Modes

Trucking is presently the dominant mode of urban goods transport because it offers flexible, door-to-door, one-mode shipment of many types of goods. It is not anticipated that the amount of trucking needed in urban areas will significantly reduce in the future.

The rail mode is presently used primarily for intercity freight movements. The location of rail facilities is fixed, and freight pickup and deliveries by other modes are only economical for relatively long-distance movements. However, the rail mode may be used for intra-urban goods movement in the future if major freight generators can be concentrated along rail facilities. The future mix of intercity goods movement by road and rail remains a question to be answered for North Pickering.

Existing public transit systems possess many characteristics that do not lend themselves to the movement of goods. Early planning in the location and design of the routes and stations might make goods movement (during off-peak periods) compatible with person movement, but present indications make the prospect unlikely.

The potential of new technology has been investigated. The systems researched appear to be too little advanced to be realistically considered for use in North Pickering.

8. Regulation of the Industry

Present Provincial legislation permits municipal control only over the routing and timing of use of trucks greater than 50 feet in length. Hence, trucks under 50 feet in length cannot be controlled but can contribute materially to disturbance.

Local bylaws in Ontario communities generally underestimate the need for a sufficient number of truck-loading and unloading bays. The existing requirements are almost all based on floor area and do not vary with the type of activity at the development.

9. Effects of Increasing Cost of Fuel

There are indications that the recent rapid rate of increase in the cost of fuel may continue in the future. If this occurs, there could be serious repercussions to the goods movement industry. In general, rapid increases to goods transport costs may result in public demands for increased efficiency in the industry.

10. Organizational Changes

Intra-urban trucking, including private trucking, is noticeably inefficient today. Each firm is concerned with only its own shipments and no effort is made to consolidate shipments and delivery services for the sake of overall economy. There exists in the planning of North Pickering an unique opportunity to

discuss options that might change present methods of operation in the industry.

It is conceivable that all goods movement in North Pickering should be under the planning and operating control of a single municipal agency. This coordinating agency could resolve some of the obvious inefficiencies of the industry to the benefit of the community as well as the industry. Furthermore, there may be some benefit to having an integrated trucking operation in the community either by contract to the municipality or as an operating branch of the Municipal Government.

11. Further Research

There are a number of specific areas which have not been researched in depth. These include need for consolidation terminals and central shipping and receiving areas, and consideration of potential non-truck modes for freight movement.

RECOMMENDATIONS

1. Sites reserved for use by heavy industry should be well served by both rail and truck facilities.
2. Light industrial development including manufacturing, warehousing and offices, should be adjacent to good road facilities.
3. Residential development should be well separated from industrial land uses.

4. Consolidation and distribution terminals for intercity shipments should be located on the outskirts of the North Pickering community and adjacent to freeway and/or rail facilities.
5. Trunk transport services should be provided for the shipment of bulk quantity and long-distance shipping of industrial-based goods.
6. Adequate road facilities should be provided for the intra-city pickup and deliveries.
7. Residential areas should be buffered from trucking and other major transportation facilities.
8. In densely developed areas such as central business districts, there should be a physical separation of goods movement traffic from pedestrian and other travel modes.
9. If goods movement by public transit is contemplated, suitable systems will have to be identified and developed in detail during the planning process.
10. Greater regulatory authority over urban trucking movements should be concentrated at the Municipal Government level. Private intra-city trucking should be controlled, as well as for-hire trucking.
11. Shipments of small size and many pieces should be consolidated.
12. A series of strategically located central shipping and receiving areas should be established in densely developed areas.
13. Further research should be conducted into:

- truck-loading facility requirements by land-use type,
- optimum location and combination of consolidation and central shipping and receiving facilities,
- measures for regulation of urban trucking without imposing unreasonable hardship on the trucking industry,
- improved goods receiving and distribution in central commercial areas,
- specific requirements for inter-modal goods movement transfers,
- planning considerations and requirements for the non-truck modes.



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